Battery Challenge (Part II)

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Lab Science 9

Plan:

* The dependent variable is the amount of voltage/current in tap water.
* All the variables we thought of:

Distance between the metals

What sort of metals

Amount of water

Amount of salt in water

Amount of cups

Amount of copper (Size)

Amount of iron (Size)

Sizes of metals

Temperature of water

* The independent variable that we chose to investigate is the amount of salt in tap water. The other variables will be held constant.
* We anticipate to use: 5g of salt, 10 g of salt, and from the 10 g of salt we are going to be diluting the solution by 1/4th each time.
* Our expectations:

If there is more salt in water, then I expect that there will be more voltage and current that is generated.

* Mathematical equation:

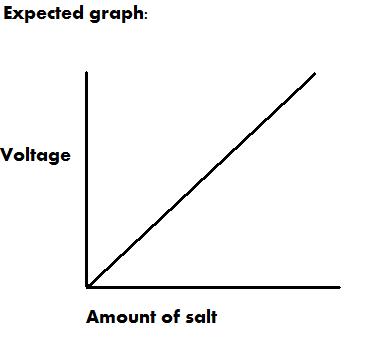
Y=MX+B

Current & voltage generated = m (amount of salt) + b

* Our table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # of experiment | amount of salt (g) | +/- | Voltage (v) | Current (amp) |
| experiment #1 | 5 | 0.01 | - | - |
| experiment #2 | 10 | 0.01 | 0.205 | 1.25 |
| experiment #3 | 2.50 | 0.01 | 2.8 | 1.47 |
| experiment #4 | 0.625 | 0.01 | 0.395 | 1.8 |
| experiment #5 | 0.16 | 0.01 | 0.418 | 1.497 |

* Our expected graph:



* Detailed procedure:

1. Measure the weight of the empty beaker on the digital balance. (10.02 g)  
2. Put salt into the empty cup, the total weight as 15.02 g. This means the amount of salt is 5 g.  
3. Get a beaker, and fill it with 200 ml of tap water.  
4. Put the thermometer inside tap water. Record temperature.  
5. Put the 200 ml of tap water into the cup, add the 5 g of salt.  
6. Stir for 30 seconds, allowing the salt to dissolve.  
7. Cut/sharpen/perfect one piece of copper, and one piece of iron. Make sure that they are in the same size.  
8. Place the metal on the inside of the cup, one on each side. Tape the metals to the side of the cup.  
9. Connect the wires onto the copper, and connect the probe from the meter onto the clips. (make sure it's turned off)  
10. Spin dial. Wait for 15 seconds. Record voltage.  
11. Spin dial. Wait for 15 seconds. Record current.  
11. Redo experiment, without removing the metals from the cup, same amount of water, same water temperature, but add 10g of salt this time. (Experiment 2)

* ***Pay close attention! This part gets tricky...***

12. Pour out 50mL of your solution (with 10g of salt and 200 ml of water), and add another 150mL of tap water. This would become 1/4th of the previous experiment. We are trying to dilute the solution.  
13. When you're done with step 12, turn the probe to V2 (voltage)-counterclockwise and count to 15 seconds to get the voltage of the experiment.  
Do the same with current but turn it off first, wait for a few seconds and turn it clockwise to Amp2.  
14. Redo step 12 and 13. until you finish all 5 experiments so you have both current and voltage.  
  
\*This is making the water dilute each time. 200/4 = 50, so basically you take 1/4 of 10g of salt, when you find the answer, take the answer and divide it by four each time. 10/4= 2.5 --> ans/4= .625 --> ...and so on..\*